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To:	Keith Phillips, Matt Steuerwalt
cc:	Juli Wilkerson, Marie Sullivan, Sue Mauermann
From:	CTED Energy Policy
Subject:	Electricity Impacts of the Drought

Executive Summary

- We are facing a manageable financial problem, not an electricity supply crisis.
- A crisis could develop if unlikely events happen all at once, but this is true any year. This year supplies appear sufficient to meet all but unprecedented catastrophes.
- Hydropower generation will be well below average, but still within normal planning parameters. Other resources are available. California energy supply is adequate for a normal summer, even to meet most heat waves. An extraordinary heat wave could overcome resources in southern California, but imports from northern California, Arizona and the Northwest should prevent blackouts. In the worst case, southern California utilities have more than 1,000 Megawatts of interruptible load.
- The recent wet weather has helped a little and if it persists will further reduce the small chance of power shortages and modestly improve the financial situation.
- The financial problem will affect utilities and their consumers differently, but at worst will be modest compared to the impacts of 2000-2001.
- Conservation and reductions in electricity use could mitigate the potential financial impact.

Electricity supply in the Western United States (including Washington and the Pacific Northwest) is more than sufficient this year to meet estimated electricity requirements. Even if major contingencies occur, such as the loss of major power plants, electricity resources should be sufficient to meet demand.

We could expect, at worst, about a 5% increase in overall electricity costs to Washington consumers with the actual rate impact varying considerably from utility to utility.

Although energy conservation can reduce the financial impact of the drought on electricity consumers, it can, at best, only modestly help other consumers of water. In most cases municipal water supplies depend on rivers other than those that generate electricity. All water used for generation remains in the river or is returned downstream so it remains available for other uses, such as irrigation.

I. Power supply and System Conditions

Electricity Supply Adequacy (also called sufficiency): There is sufficient electricity supply this year, from all sources, to meet estimated demand in the entire Western Interconnection,[1] including estimated peaks and assuming a normal number of contingencies. Compared to 2001, we have more water, less demand, greater thermal and renewable supply, and California is in better shape.

- According to Northwest Power Pool data, demand in 2005 is running about 800 Megawatts less than in 2001; load growth has been offset by the loss of DSI load.[2] At the same time, Northwest Power and Conservation Council data shows the region has constructed about 2,600 Megawatts of new natural gas-fired combustion turbine and utility-scale wind resources that are not affected by drought.

- The Northwest Power and Conservation Council calculates the probability of loss of load due to drought in the Pacific Northwest this year (including the coming winter) as less than one percent.

- The Council estimates that the region has a continuous (on top of peak) electric energy surplus of approximately 1,250 Megawatts, assuming critical water and no unexpected new large loads (the calculation includes a very high estimate of DSI demand – 983 Mw).

- The region should have more water than the amount defined as "critical water." If the region ends up with the amount of water currently estimated (70 percent of normal at The Dalles) the region will have about 1,000 Megawatts more energy than under critical water – leaving the region with a cushion of about 2,250 Megawatts (1,250 surplus + 1,000 above critical water) – more if a more realistic lower DSI load is assumed.[3]

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[1] The Western Interconnection includes all the western United States from Colorado and New Mexico to the West Coast, and from British Columbia and Alberta to the Mexican border (a small area of Baja California is included).

[2] DSI stands for Direct Service Industries, primarily aluminum plants that served directly by BPA.

[3] The most typical measure of Columbia River water supply is January to July stream flow at The Dalles. This is a reasonably good measure of potential hydropower generation, but does not provide the whole picture. For example, January to July stream flow in 1977 was lower than in 1937. But in the period September to March, 1936-37 stream flow was lower than in the same period 1976-77. Critical water is calculated as the lowest water supply period in history, whether or not it occurs from January to July. Based on critical water (using 1936-37) the region has a 1,250 Megawatt surplus. Based on projected stream flow (January to July at The Dalles), the region has an additional 1,000 Megawatts above critical water.

- For large, extended contingencies that would compromise even a 2,250 Mw energy surplus, the region has very large import capability (6,500 Mw from California alone) and the largest generating capacity reserves in the nation (approximately 27 percent, or 23,500 Mw, according to the Western Electricity Coordinating Council). Northwest load peaks in the winter, so imports from California are a potential resource, just like our resources are available to assist California as they peak in the summer.[4]

- Exports of electric power from the Northwest to California need not represent absolute losses of generation for the Northwest. In 2001 the Northwest exported power during the day and imported power during the night. For energy that was to be returned at a future date, imports were returned at double and occasionally triple amounts (for no additional cost).

- California investor owned utilities (IOUs) are required to have supply to meet estimated peak loads (1 in 2 year peak) plus 15 to 17 percent in reserves. These are more stringent requirements than in 2001. At a recent California Energy Commission hearing on electricity supply all the IOUs and major publicly owned utilities reported that they meet this standard. A new more stringent measure, not required by regulation, a 1 in 10 year peak, was also discussed at the hearing. A 1 in 10 year peak temperature has occurred only twice in the last 25 years; i.e., there have been two events. Only San Diego Gas and Electric claimed they could not meet this standard. A 1 in 10 year peak heat wave in southern California would require SDG&E to seek resources elsewhere - from northern California, Arizona or the Northwest. Sufficient resources should be available. In California alone, 17 of 20 hydropower rivers had snow pack above 100 percent this year, some as high as 160 percent.

- Transmission line problems in both regions are at greatest risk during hot, summer weather. (See the Reliability section below.)

Electricity Reliability (outages – usually measured as customers out)

Electricity reliability concerns are less due to low water than to localized transmission constraints and general transmission system conditions. In a nutshell, the Western Interconnection operates at high capacity generally with some corridors at unusually high risk. Rolling blackouts conducted by California utilities in 2001 were not due to insufficient California supply, but to a congested transmission corridor – electricity could not be moved to where it was needed.

Washington transmission corridors and regional corridors Washington relies on are significantly stressed. Natural events (tree fall, windstorm), equipment failure or operator error could cause outages in Washington this year (as in any year). Two types of outages are

[4] The 2,250 Mw surplus is energy, meaning that amount of supply is available if needed for 12 full months (or 5,500 Mw for six full months). Capacity reserves are those that can be used to meet short-term peak demand. For example, Grand Coulee has about 6,500 Mw of capacity that can be run to meet peak needs. But there is never enough water to run the dam at full capacity for very long, so Grand Coulee averages about 2,000 Mw each year.

at risk: Cascading system outages, and localized outages. Localized outages are most likely, due either to natural events that destroy system infrastructure, or to equipment failure (such as when a high capacity transmission line heats up). Cascading system outages occur when the system cannot respond quickly enough to isolate regions from automatic shutdown. Transmission failures of all types are most likely during hot weather – June through September in Washington.

Power Quality: (Excursions from voltage and frequency standards)

Power quality failure is most often a localized issue – distribution system conditions fail to deliver adequate voltage to customers. However, natural events, equipment failure and operator error, can lead to broad system power quality problems that affect millions of customers (such as brownouts). If not controlled, these can lead to damaged system and end-use equipment and to outages. Risk is highest when loads, temperatures, and transmission capacity is high. Drought, generally, should have no impact on power quality.

II. Financial situation

We have attempted to analyze the financial effects of the drought, if it continues, in a number of ways. First, we investigated the situation of each utility in the state that owns or purchases a substantial amount of hydropower generation that could be affected by the drought. Second, we estimated the aggregate cost to Washington ratepayers of using gas-fired generation to replace the lost hydro either through their own generation or market purchases. Third, we estimated how much of the increased cost could be avoided through a 5% reduction in electricity use across the state. Finally, we consulted with staff at the NW Power and Conservation Council and at BPA to understand how they view the regional picture.

Our utility by utility analysis indicates that all utilities with hydropower generation are expecting substantial reductions in output. The impact varies by whether their hydro projects are on the east side or the west side of the Cascades. West side projects like Tacoma's Cowlitz River dams and Seattle's Skagit river generation are in much worse shape than projects that rely upon the main stem of the Columbia or its tributaries. Nevertheless all utilities have reported, either to us privately or in public statements that they are on top of the situation. Many, anticipating the need, have already bought power to cover any shortfalls. Others are actively involved in the market. Any problems will come from errors in execution not from lack of foresight. Or from unforeseen events? Our utility by utility analysis can be found in Appendix A.

Depending on their specific situation, Washington utilities will have to replace all, some or none of lost hydro with electricity from gas fired turbines. Electricity generated by natural gas could cost many times the cost of the power it replaces. However, the replacement energy will still be only a small percentage of any utilities total costs so the rate impact will not be very large.

Looking at the statewide financial impact of the drought on electricity costs, our analysis indicates that the 2005 drought could potentially increase the cost of supplying electricity by 199 to 313 million dollars. (See Appendix B for the complete analysis) This would be the equivalent of 4-7% overall increase in electricity costs to Washington consumers. We should note that if these cost increases occur actual rate increases would vary greatly from utility to utility. An increase in electricity costs would be the direct potential impact of requiring natural gas fired generation to make up the shortfall in hydro generating capability. There are at least two other ways that the drought could affect businesses and consumers. First, because many of our utilities and the Bonneville Power Administration sell their surplus power into the market the drought can potentially reduce this source of revenues, and eventually impact electricity rates. There could also be a secondary market impact if too much demand chases too few supplies thereby driving wholesale power prices even higher. These factors confound each other for utilities selling into the market. Secondly, using more natural gas for electricity generation can drive up regional natural gas prices which will have an impact on businesses and consumers that use natural gas directly for space or steam heating.

Our analysis also indicates that a relatively modest goal of reducing electricity consumption by 5 percent has the potential to directly save many millions of dollars. A conservation program would also improve the situation for utility sales of surplus electric power and reduce the upward price pressure on natural gas market. There is a similar incentive for natural gas distribution utilities to assist their customers in using gas more efficiently.

III. Reduction in use will mitigate impacts

There are two strategies for reducing energy use during a drought. The first is to increase the level of cost-effective energy efficiency in our economy in a targeted, accelerated fashion. The second strategy is for businesses and households to curtail their energy use – that is to do without. The general public will lump these two strategies together as "conservation."

Curtailing Energy Use

One strategy for saving energy is to ask customers to curtail their energy use.

Broadly stated, political leaders and utilities can sponsor campaigns to save energy. Consistent messaging by political and opinion leaders provides independent, or "third-party," support of local utility campaigns. The print and broadcast media in 2000 and 2001 regularly featured state and local leaders' perspectives on what people could do to save energy. These campaigns can rely on either or both paid media advertising or free media coverage focused on events. (See Appendix C for examples of past campaigns and options for the current situation)

Curtailment for households translates into energy savings that have no cost, except for inconvenience, such as turning out the lights when you're not in the room, shutting down computers not in use, turning the thermostat higher on air conditioners or turning the thermostat lower on furnaces. This approach typically has economic consequences for industries and farmers; they are likely not fully operating their plants or irrigating all of their crops if they are cutting their energy use.

Energy Rate Strategies

There are numerous rate strategies that have been tried by utilities over the last twenty years during times of crisis. Most of them worked. The strategies were typically introduced at times of real energy shortages. These range from simple approaches like 50% general rate increases, to doubling of rates for the last 10% of power use – based on the previous year's energy consumption (the customer who saves 10% of weather-adjusted energy over last year doesn't pay the doubled rates), to paying customers a nickel for every kWh they saved compared to their last year's weather-adjusted bill.

During the energy crisis several utilities and Bonneville paid customers to not use electricity; this was a successful, but costly, mechanism for reducing energy use. One consequence of paying some large power users to stop using utility electricity is that these customers rely on diesel back-up generation. Given the abnormally high costs of diesel at this time, it would be both financially and environmentally costly to operate diesel back-up generation.

Accelerating Energy Efficiency

The opportunities for accelerating the implementation of energy efficiency include the following:

- Utilities can temporarily increase their incentive rebates to customers for installing energy efficiency measures to stimulate a "sale" mentality. So long as they remain cost-effective, incentives could be increased for a short period of time. The temporary higher incentive levels encourage consumers to take action soon and may sway consumers to install additional energy savings measures.

- Bonneville is pursuing accelerating its efforts to "buy-down" the cost of compact fluorescent bulbs in the Pacific Northwest. The intent is to pay manufacturers to ensure that products are available to consumers for 99 cents per bulb (versus $3-7 per bulb currently). A marketing campaign would accompany this buy-down effort so that customers appreciate the value of the product. Bonneville will likely partner with other electric utilities in the region to co-sponsor this program. This could start as soon as mid-summer 2005. If one-third of Washington's households bought two compact fluorescent light bulbs for their home lamps they would collectively save 75 million kilowatt-hours of electricity in the coming year.

- Energy and water utilities could jointly implement a program to replace commercial kitchen pre-rinse spray valves. Doing so would save water, natural gas, and electricity. If the utilities provided incentives for each of the spray valves getting replaced in the next twelve months, then we estimate the first year savings to be 1,349,000 therms of gas, 10,241 megawatt-hours of electricity and 357 million gallons of water. If the utilities in Washington partnered to replace one-half of all the spray valves in the state in the coming twelve months then we estimate the first year savings to be: 3,370,000 therms of natural gas, 25,000 megawatt-hours, and 892 million gallons of water. Puget Sound Energy has an active program installing these throughout their service territory. Bonneville is considering implementing a spray valve program during the drought.

- Energy and water utilities could jointly implement incentive programs for commercial clothes washers. If they captured one-half of the commercial washers due to be replaced in twelve months, we estimate the first year savings to be 482 megawatt-hours, 80,000 therms, and 24 million gallons of water.

- State government and local governments could partner to remove every standard incandescent bulb in their offices to replace them with compact fluorescent bulbs. They could facilitate this with a bulk buy of compact fluorescent bulbs from wholesalers or negotiate deals locally.

- More aggressively, GA could assign one of its capital campus facility managers to lead an effort to transfer all the low-cost energy efficiency strategies that GA has implemented on the capital campus to all state facilities. This would include, for example, unplugging light bulbs in soda machines, unplugging personal coffee makers, retraining janitors to turn off the lights and copiers, etc.

More Information

See Appendix C for more program ideas and Web links for Conservation.

See Appendix D for a revised version of “Great Energy Habits to Adopt.”

Appendix A

Impact of the 2005 Drought on Washington State Utilities.

Chelan PUD

Generation is expected to be 70 to 80 percent of normal, which is enough to cover county loads, but surplus sales will be reduced to approximately 50 percent of normal. Chelan PUD is dependent on the timing of water releases from Grand Coulee dam. Revenues will be down, but perhaps not much as sales volumes would predict as prices for surplus power will be up. The utility has contingency plans for generation and financial shortfalls. Chelan PUD anticipates moderate irrigation, fish migration and transport problems as well, primarily on Lake Chelan.

Grant PUD

Grant PUD secures approximately 50 percent of its electricity from the BPA by way of a fixed contracted[5]. There should not be a problem with the BPA contract unless the drought is very severe. Grant County's own hydro-generation is expected to produce at 80 percent of normal. Grant PUD is also dependent on the timing of releases from Grand Coulee dam. Grant PUD has contingency plans for generation and financial shortfalls, and has load reduction agreements with industrial customers. There maybe irrigation and rate problems because of the drought – depending on spring/summer rainfall, etc.

Douglas PUD

Douglas PUD expects its own generation to be 87 percent of normal, and does not anticipate financial problems that will lead to a rate increase. There will be a 13 percent reduction in surplus sales, but market price may make up this difference. Not other drought related issues to report.

Cowlitz PUD

Cowlitz receives the bulk of its power from BPA and is a slice customer[6]. Expectations ate that the federal system will deliver at 63 percent of normal power. Cowlitz owns a couple of small Westside hydro projects which are expected to only generate 20 percent of normal. The PUD also buys some power from Grant PUD and expects to receive about 63 percent of normal power purchases. The shortfall will be made up by market purchases, probably mostly coal and gas thermal generation. These market purchases will likely impact the PUDs financial situation and rates.

Snohomish PUD

Snohomish PUD receives about 80 percent of its power from BPA through the Block and Slice products (mostly hydro, and about 9 percent nuclear), generates about 8 percent of its power from its own west-side resources, and purchases about 12 percent of its power from the market: about 6 percent hydro power from other regional sources and 6 percent from thermal generation resources.

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[5] BPA fixed contract is for a specified amount (Mwh) of electricity

[6] Slice customer contracts give the PUD a certain slice (percentage) of the BPA generation. In a drought year the amount of power supplied by BPA goes down.

They report that they "expect to receive approximately 6% less energy from resources than was assumed in the utility's 2005 budget for the remainder of the year. That percentage increases to nearly 10% if we narrow the focus to the summer months ending September 30." They will have less surplus power to sell, but may get higher prices for what they do have. They will also purchase power as needed to ensure that they aren't short.

Avista Utility

In a normal year Avista relies on hydro generation for 70 percent of its power, while coal supplies nearly 25 percent and biomass nearly 5 percent. Avista generates about 50 percent of its load from hydro resources that the utility owns. This years forecast is for only 80 percent of normal generation, so the utilities hydro resources will generate only 40 percent of its power needs this year. Avista relies on contracts for the other 20 percent of its power – we can assume that these contracts will deliver less than normal power, perhaps 15 percent. This leaves a shortfall of 15 percent of load, which will be made up by thermal resources, primarily coal and natural gas fired generation. In 2001, another drought year, natural gas fired generation made up 15 percent of Avista's generation.

Seattle City Light

Seattle City Light resource supply was more than 90 percent hydro power in 2004. This year Seattle City Light expects significantly less runoff for its Westside hydro generation resources – 53 percent of a normal year. In addition SCL expects its BPA slice to be 61 percent of normal. However, SCL often sells surplus power into the market, so it may not be short of power except if a severe drought develops. SCL has implemented long-term resource portfolio (wind generation, etc.) and financial measures to guard against the impacts of drought. There will be financial impacts in 2005, but there will not necessarily be rate impacts. SCL expects to meet all fishery and environmental commitments this year, but there is a 50 percent chance that the Ross reservoir will not fill up this summer, which could impact recreation activities.

Tacoma Power

Tacoma Power has four hydro projects that supply 40 percent of power needs in a normal year – most of the rest is from BPA. Runoff for these west-side projects is projected to be at near record lows – in the 50 to 55 percent range. Despite lower hydro generation TP will have sufficient power to meet its load. There are two reasons for this outcome. First, the load that TP currently serves is smaller than in 2001, due to the loss of some industrial load. Second, in a non-drought year TP has excess power that it sells on the market. Revenue from market sales of excess power may be smaller this year. Balancing fish, power, and recreation needs will be a challenge.

Puget Sound Energy

Puget Sound Energy obtains 46 percent of its power from hydro generation – a combination of utility owned Westside projects and contracts with Mid C PUDs. About 30 and 20 percent of PSEs power comes from coal and natural gas fired generation respectively. PSEs own hydro generation is expected to be 50 to 60 percent of normal, contract purchases may be slightly better. PSE expects to fill the gap primarily with natural gas fired thermal generation. Relying on natural gas fired generation will probably be expensive, particularly if natural gas prices remain high and California has a hot summer.

Bonneville Power Administration

The Bonneville Power Administration forecasts runoff in the Cascades sub-basins, between 25 to 50 percent of normal, between 90 and 100 percent of normal in Canadian basins, and 50 to 75 percent of normal in the Rocky Mountain basins. The January-July flow at the Dalles (a frequently used measuring point) is forecast at 70.7 million acre-feet, or 66 percent of normal – note that this figure does not account for the heavy rains and snowfall of the last week or so. The Columbia Generating System will be down for refueling in May, but is expected to fully operational in June before demand in California begins to increase.

In discussions about this year's drought the BPA has noted several differences between the drought of 2005 and 2001. In 2001 the region had a 4,000 megawatt deficit, while this year there is a 1,000 -1,500 megawatt surplus relative to critical water conditions. Since 2001 the Pacific Northwest has added several thousand megawatts of natural gas fired thermal generation to its resource mix. In addition California is now in much better condition than it was in 2001 with good hydro resources this year and having also added a large quantity of thermal generation.

While there is little chance of curtailment this year, many individual utilities will have to go to the market to make up for shortfalls in hydro resources, or rely more heavily on recently installed natural gas fired generation, both of which will be costly. For a few utilities rates may be impacted by this need for more costly power. The drought will severely reduce market sales of electricity by the BPA and several PUDs which may affect their anticipated revenue stream. However, the anticipated higher prices may partially make up for the reduction in surplus sales. The drought will likely impact fish related flow targets at many dams and may impact recreational use of some reservoirs as well.

Appendix B

<u>Assessing the Financial Impact of the 2005 Drought: Electricity Costs</u>.

The electricity supply in the Pacific Northwest is more than adequate for this summer and fall – the Northwest Power and Conservation Council estimates that the Pacific Northwest region has 1,100-1,500 megawatts of surplus power using critical water conditions (a point we haven't reached yet) as the benchmark. The drought will cause the Pacific Northwest region to rely more heavily on natural gas fired thermal generation, which because of continuing high gas prices is significantly more expensive than the hydro power that it is replacing.

The assumptions for this analysis are as follows. As in 2001 this year's drought will force utilities to make up hydro generation shortfalls by using natural gas fired generation, either using their own power plants or by going to the market to purchase electricity. To make our forecast of the amount of natural gas fired generation in 2005 we begin with a conservative assumption, we assumed that the 2005 drought will result in the same amount of natural gas being burned for electricity generation as in 2001. This is a slightly conservative assumption as the 2005 drought is not yet as severe as the one in 2001. We compare the forecast 2005 electricity natural gas consumption to the consumption in 2002, which was a normal year for runoff and hydro power generation. The difference between our 2005 forecast and the actual 2002 consumption represents the estimated additional natural gas necessary to make up for the drought conditions. We use an average heat rate for natural gas fired generation of 8000 Btu/Kwh to estimate the amount of additional electricity that will be supplied. We then apply a range of incremental costs (dependent on future natural gas prices) for the estimated additional natural gas fired electricity to estimate additional cost to utilities and ultimately ratepayers. Finally, we attempt to determine the range of financial impacts if an electricity conservation goal of 5 percent is achieved statewide.

Electricity sales, expenditures and natural gas consumption in the electricity sector are shown in Table 1 below. Sales are in millions of megawatt-hours (Mwh), expenditures in millions of dollars, gas consumption is in million cubic feet.

Table 1: Electricity sales, expenditures and natural gas used for electricity generation

Year	Electricity sales (million Mwh)	Electricity expenditures (millions $)	Natural gas for electricity (Mcf)	Additional natural gas use relative to 2002
2000	96.5	4,131	74,400	34,848
2001	79.7	4,141	86,184	46,632
2002	76.5	4,437	39,552	-
2003	78.1	4,577	53,868	14,316
2004 est.	82.6	4,601	61,077	21,525
2005 forecast	---	---	86,184	46,632

Using the forecast of additional natural gas use for 2005 (46,632 Mcf) we estimate that 5.7 million Mwh of additional natural gas fired generation will be necessary in 2005 based on the assumptions given above. The additional cost[7] of the natural gas fired generation under low, mid and high gas price regimes is given in Table 2 below. Also included in Table 2 are the additional costs if a 5 percent conservation goal is achieved.

Table 2: Estimated additional costs for natural gas fired electricity generation

Scenario	Additional gas fired genr. (Mwh)	As a percent of total 2004 genr.	Cost regime: incremental $/Mwh	Additional cost (millions $)	Increase in electricity expenditures
Business as usual	5.69 million	6.9%	Low 35	199	4.3%
			Mid 45	256	5.6%
			High 55	313	6.8%
5% Conservation	1.86 million	2.3%	Low 35	65	1.4%
			Mid 45	84	1.8%
			High 55	102	2.2%

The results in Table 2 indicate that the 2005 drought could potentially increase electricity costs by 199 to 313 million dollars, or about 4 to 7 percent of total 2004 electricity expenditures. These are the direct potential impacts of requiring natural gas fired generation to make up the shortfall in hydro generating capability. There are at least two other ways that the drought could further affect businesses and consumers. First, because many of our utilities and the Bonneville Power Administration sell their surplus power into the market the drought can potentially reduce this source of revenues, and eventually impact electricity rates. Secondly, using more natural gas for electricity generation can drive up regional natural gas prices which will have an impact on businesses and consumers that use natural gas directly for space or steam heating.

Table 2 also indicates that a relatively modest conservation goal of reducing electricity consumption by 5 percent has the potential to directly save many millions of dollars. A conservation program would also improve the situation for utility sales of surplus electric power and reduce the upward price pressure on natural gas market.

[7] Additional cost means the cost above typical northwest wholesale electricity costs.

Appendix C

Energy Curtailment Strategies

During the energy crisis of 2001 Washingtonians could walk into some grocery stores or into public places such as SeaTac and see signs announcing their efforts to save energy. The businesses or the port may have reduced their lighting levels or posted "thermometers" charting their progress towards the 10% conservation target. Campaigns can be simple such as turn out the lights or shut-off your computer when not in use. Seattle City Light (and perhaps Snohomish PUD and Tacoma) financed one of the most visible campaigns during the 2001 crisis. They hired the King 5 news team, primarily the trusted weatherman, to announce an energy saving tip every night during the local evening news. However, this was in the midst of a full-blown energy crisis, not a drought. Keep in mind that the public – those who are environmentally conscious – may hold the perception that saving energy during a drought may result in preserving water in the river for increasing fish survival. Bonneville's current conservation efforts do not achieve this end; Bonneville is focused on reducing sales to preference customers in order to continue secondary market power sales.

Campaigns can direct consumers to purchase an energy saving product now - if you are shopping for a new appliance or even light bulbs, you can shop for Energy Star products that are well-known for their energy efficiency.

Campaigns can focus on icons – such as turning out the non-essential lights on the capitol building's dome or energy saving events at Mariner's baseball games.

Web Links for Conservation

Bonneville and many of Washington's electric utilities provide energy saving tips on their web sites that include recommendations as simple as turn-off lights that aren't in use, shut-down office computers at night, run full loads for dish washers and clothes washers (which saves water, too), and vacuum the coils on your home refrigerator. CTED emailed a request in March to utilities seeking links to websites that provide energy conservation information for consumers. We will update this list as we receive responses.

Households

http://www.bpa.gov/Energy/N/Energy_Tips/save_energy
http://www.pse.com/yourhome/waystosave/index.html
http://www.avistautilities.com/saving/default.asp
http://www.ci.tacoma.wa.us/power/ResidentialServices/FactSheets.htm
http://www.ci.tacoma.wa.us/power/
http://tacoma.apogee.net/rescalc/
http://www.seattle.gov/light/conserve/tips/
http://www.seattle.gov/light/printdocs/savingelectricity.PDF
http://www.seattle.gov/light/Publications/pb4_broch.asp
http://www.seattle.gov/light/printdocs/SavingElectrenters.PDF

Businesses

http://www.avistautilities.com/saving/com_saving_tips.asp
http://www.bpa.gov/Energy/N/Energy_Tips/save_energy/business.cfm
http://www.saveawatt.info/Energy/N/Energy_Tips/save_energy/at_work.cfm
http://www.pse.com/yourbusiness/grants/grants.html
http://www.ci.tacoma.wa.us/power/Business/fact_sheets.htm
http://www.seattle.gov/light/printdocs/energysavingtipssmbus.PDF

Included, as Appendix D, "Great Energy Habits to Adopt."

Appendix D

Energy Saving Ideas

1. Lower your thermostat at night and when you're not home. Use a programmable thermostat so it's automatic. Every degree lower can take 2 percent off your power bill.
2. Make it a habit to shut off lights, computers and other appliances when you're not using them.
3. Switch to compact fluorescent bulbs. They use a fourth of the energy used by regular bulbs.
4. Replace halogen lamps in torchieres with compact fluorescent torchieres. They use about 70 percent less energy and produce more light.
5. Use motion detectors to turn on outdoor lights rather than leaving them on all night.
6. Close your fireplace damper when there's no fire. Leaving it open is like having a 48-inch square hole in your house.
7. Close off and don't heat unoccupied rooms.
8. Take showers with low-flow showerheads (they use 50 percent less hot water) instead of baths.
9. Set your water heater at 115 degrees (F), which is comfortable for most uses. Turn your water heater off when you go on vacation.
10. Wrap your water heater in R11 insulated wrap but don't cover the thermostat.
11. Run only full loads in your dishwashers and clothes washers and wash in warm or cold water.
12. Air dry your dishes. In nicer weather or in a warm basement, air dry your clothes.
13. Clean your furnace and heat pump filters to keep them operating efficiently.
14. In the winter, open south-facing drapes and blinds during the day to let heat in.
15. Weather-strip around your doors and windows and anywhere you feel a draft.
16. Set your refrigerator between 37 and 40 degrees. (F).
17. Keep your refrigerator well stocked. It takes more energy to cool an empty fridge.
18. Clean lint out of refrigerator coils and out of dryers.
19. Use a microwave or toaster oven for cooking and heating small portions.
20. Check ceilings and crawl spaces to ensure there's adequate insulation.
21. Seal or fix broken basement windows.
22. Fix broken ducts and replace cracked or peeling tape on ducts. Hand-applied mastic or aerosol sealants are effective at sealing leaky ducts.
23. For long-term savings, choose and use energy-efficient appliances. Compare energy rating labels before you buy.